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Selected properties of hydrogen (engineering design data)  
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ABSTRACT

The National Bureau of Standards has been engaged in the compilation, review, analytical and experimental derivation, and publication of hydrogen properties for over 20 years. The Properties data presented herein are compiled largely from those accumulated data; of course, pertinent data and work of other researchers in the field are also included.

The general interests of scientists and engineers engaged in energy systems studies were given top priority in choosing properties material presented in this book. Hydrogen systems cut across many energy related fields, e.g., nuclear fusion, magnetohydrodynamics, electrolysis and thermochemical decomposition of water, coal and shale derivative fuels, solar and wind power, ocean energy, geothermal processes, etc. It is generally conceded that hydrogen could be used to satisfy virtually all fuel requirements that are currently being met with natural gas and oil. To satisfy the demand for properties data over this broad spectrum of interests, we have attempted to provide comprehensive coverage of physical properties over a wide range of pressures and temperatures.

Thermophysical properties of liquid, liquid-vapor, vaporous, and gaseous hydrogen are presented in Chapter 1 and the solid-liquid, solid-vapor, and solid phase properties are compiled in Chapter 2. Ortho-para modifications of the hydrogen molecule and attendant property variations are considered in both chapters. Combustion and safety data, pertinent to hazard analysis of hydrogen systems, is collected in Chapter 3. Important miscellaneous properties are compiled in Chapter 4, data figures are compiled in Chapter 5, data tables are collected in Chapter 6, and Chapter 7 summarizes symbols, units, and conversion factors used throughout the book.

Key words: Hydrogen; hydrogen computer codes; hydrogen design data; hydrogen-gas; hydrogen graphs; hydrogen handbook; hydrogen-liquid; hydrogen properties; hydrogen safety; hydrogen-solid; hydrogen tables; hydrogen thermophysical properties.